Issue Paper for Meeting # 4		*Number of Members Present: ____*	
Sewage Tanks Water Tightness	**Topic Number: 1**	*50% +1= ____*	*Two Thirds = ____*

Topic Statement	**Establish Water Tightness Standards & Testing Requirements for Sewage Tanks**
Problem Statement	Sewage tanks are an integral part of all on site septic systems. The tank may be a septic tank, a pump chamber, a tank that is part of a proprietary treatment process or other treatment component, a grease trap, or other type of tank. Our greatest effort must be to get properly sized, structurally adequate and water tight tanks to all installations to ensure the quantity, quality and consistency of the discharge. Current regulations require water tightness but enforcement is almost nonexistent. Testing criteria need to be established for gauging and enforcing quality. Because of potential public health exposure and/or ground water contamination leaky tanks are unacceptable. Therefore w*e must develop requirements for sewage tanks water tightness to be included in the sewage tanks rule.*
Background	• The primary purpose of a sewage tank is to protect more expensive downstream system components. The size, shape, flow patterns, and other tank features do this by subjecting the wastewater to anaerobic decomposition, reducing the volume of solids, capturing as many solids from the wastewater stream as possible, modulating surges that can push solids downstream, and discharging a relatively clarified effluent. • Explicit details and specifications are necessary to ensure quality tank construction. Even so, unless strict quality control is uniformly enforced, manufacturers of quality tanks will find it hard to compete with those who make inferior tanks and sell them cheaply. The extra cost of a high quality tank is insignificant when compared to the cost of maintaining or replacing a system with inadequate tanks. • Where ground water levels are high, leaky tanks allow infiltration that causes solids and greases to wash through the tank, lowering treatment efficiency and leading to the eventual failure of onsite disposal systems. Hydraulic overloading due to tank leakage causes degradation in the tank's effluent quality. Settleable and floatable solids, grease and oils are flushed from their storage zones. Water tight tanks allow more cost effective treatment. Infiltration into leaky pump chambers and tanks used in advanced treatment process is especially concerning. • Where high groundwater is not a problem, a leaky tank will exfiltrate, lowering the scum layer to the outlet level where the floatable solids, fats, soaps, oils and greases can be dosed or washed through the outlet assembly. Exfiltration from leaky tanks located in coarse and/or shallow soils is especially concerning. Effluent that leaks into groundwater from a leaky tank contributes to groundwater contamination. Exfiltration hinders segregation and biological activity and proper development of a clear zone. Effluent quality degrades, organic digestion diminishes and service frequencies increase. Eventually, system failure ensues and/or maintenance becomes excessive and costly. • For wastewater systems with sewage tanks to be efficient and reliable, and for predictions of solids accumulations and pumping intervals to have validity and continuity, **sewage tanks must be water tight.**

Issue Paper for Meeting # 4		*Number of Members Present: ____*	
Sewage Tanks Water Tightness	**Topic Number: 1**	*50% +1= ____*	*Two Thirds = ____*

Reference / Research

On-Site Sewage System Tanks RS&G

1.1 The intent of these standards is to meet the provisions and requirements of WAC 246-272A and WAC 246-272B for protecting the public health by minimizing the potential for public exposure to sewage from on-site sewage systems and adverse effects to public health that discharges from on-site sewage systems may have on ground and surface waters. WAC 246-272A states sewage leaking from a septic tank, pump chamber, holding tank, or collection system as an example of a system failure. Therefore, sewage tanks must be designed and constructed to be watertight to prohibit leakage of sewage from the tank for the purpose of limiting public exposure to sewage. Additionally, sewage tanks must be designed and constructed to be watertight to prevent the entrance of surface drainage and ground water into the tank which may lead to hydraulic overload, unpredictable performance, and failure of the sewage system.

2.1.2.5 A professional engineer shall complete and submit a certification form with the design documents which states that the tank meets the requirements of these standards including the water-tightness standard. The design must specifically indicate the design loading of the tank including maximum traffic loading and earth loading.

2.1.2.6 The manufacturer shall complete and submit a certification which certifies their sewage tank as being watertight at the point of manufacturing or be responsible for placing the tank in its excavation on the project site and performing the water-tightness test after placement.

3.1.1 Sewage tanks, inlet/outlet penetrations, electrical conduit penetrations and riser/tank connections must be designed and constructed to be structurally sound and watertight in order to prohibit leakage of sewage from the tank for the purpose of limiting public exposure to sewage and to provide maximum treatment efficiency. Additionally, sewage tanks must be designed and constructed to be watertight to prevent the entrance of surface drainage and ground water into the tank, which may lead to hydraulic overload, unpredictable performance, and failure of the sewage system.

4.2.1 Sewage tanks must be tested for water-tightness at the project site and witnessed by the local health officer or by an individual, such as the project design engineer, designer, installer, or homeowner (if the sewage system was designed or installed by the homeowner where local regulations allow), designated by the local health officer. For all LOSS, all sewage tanks must be tested for water-tightness at the project site and witnessed by the department or by the project design engineer. If the tank manufacturer (as per section 3.1.2.6) or tank delivery entity performs the water tightness test, the requirements in this subsection must be followed.

4.2.2 Sewage tanks must be tested for water-tightness in accordance with ASTM C 1227 Section 9.1.1 - "Vacuum Testing" or 9.1.2 - "Hydrostatic Testing".

Water Tight Testing Regulatory Requirements

See attached document for summary of water tightness rules from other states provided by Sam Carter with Orenco Systems, Inc.

LOSS Rule Advisory Committee

All below ground tanks must be field-tested for water tightness.

Issue Paper for Meeting # 4		*Number of Members Present: ____*	
Sewage Tanks Water Tightness	**Topic Number: 1**	*50% +1= ____*	*Two Thirds = ____*

Questions

1) Should the rule contain testing criteria to ensure that sewage tanks are water tight?
   a. If **Yes** then go to question #2.
   b. If **No** then go home.
2) Should the rule require tank manufacturers to certify water tightness of sewage tanks at the point of manufacturing?
   a. If **Yes** then go to question #3.
   b. If **No** then go to question #4.
3) What details should be in the rule for tank manufacturer certification of water tightness? Then go to question #4.
   a. # of tanks tested. **Yes No**
   b. Method of test. **Yes No**
   c. NPCA certification for concrete manufacture. **Yes No**
   d. Other (specify). **Yes No**
4) Should the rule require all tanks to be tested for water tightness after installation?
   a. If **Yes** then go to #6.
   b. If **No** then should the rule require in-field water tightness testing at any of the following situations: If the response to any of the situations is "**Yes**", go to #5 & #6. If the responses to all are "**No**", go to #5.
      i. All tanks in coarse or shallow soils. **Yes No**
      ii. All tanks in Puget Sound Counties. **Yes No**
      iii. All pump chambers in water table. **Yes No**
      iv. Tanks used for advanced treatment. **Yes No**
      v. Any other situation (specify). **Yes No**
5) Where in-filed water tightness testing is not required, should the rule allow the health official (county or DOH) to determine if/when a tank should be tested for water tightness in the field?
   a. If **Yes** then go to # 6.
   b. If **No** then how can we ensure that sewage tanks are water tight?
6) When in-filed water tightness testing is required, what methodologies should be specified in the rule? For ideas see section 4.2 of On-site Sewage System Tanks RS&G testing for water tightness and section 4.3 tank certification and submittal requirements.